1. Record Nr. UNINA9910819744203321

Autore	Wang Yun
Titolo	PEM fuel cells : thermal and water management fundamentals / / Yun Wang, Ken S. Chen, and Sung Chan Cho
Pubbl/distr/stampa	New York : , : Momentum Press, LLC, , [2013] ©2013
ISBN	1-299-45668-5 1-60650-247-6
Descrizione fisica	1 online resource (420 p.)
Disciplina	621.312429
Soggetti	Proton exchange membrane fuel cells
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preface -- List of figures -- List of tables -- Nomenclature -- 1. Introduction -- 1.1 Energy challenges -- 1.2 Fuel cells and their roles in addressing the energy challenges -- 1.3 PEM fuel cells -- 1.3.1 PEM fuel cell operation -- 1.3.2 Current status of PEM fuel cells -- 1.3.3 Thermal and water management -- 2. Basics of PEM fuel cells -- 2.1 Thermodynamics -- 2.1.1 Internal energy and the first law of thermodynamics -- 2.1.2 Enthalpy change -- 2.1.3 Entropy change and the second law of thermodynamics -- 2.1.4 Gibbs free energy and thermodynamic voltage -- 2.1.5 Chemical potential and Nernst equation -- 2.1.6 Relative humidity and phase change -- 2.2 Electrochemical reaction kinetics -- 2.2.1 Electrochemical kinetics -- 2.2.2 Electrochemical mechanisms in PEM fuel cells -- 2.2.3 Linear approximation and Tafel equation -- 2.3 Voltage loss mechanisms and a simplified model -- 2.3.1 Open circuit voltage (OCV) -- 2.3.2 Activation loss -- 2.3.3 Ohmic loss -- 2.3.4 Transport voltage loss -- 2.3.5 Current-voltage (I-V) curve and operation efficiency -- 2.3.6 Role of water and thermal management -- 2.4 Chapter summary -- 3. Fundamentals of heat and mass transfer -- 3.1 Introduction -- 3.2 Conservation equations -- 3.2.1 General forms -- 3.2.2 Mass and momentum conservation -- 3.2.3 Energy equation -- 3.2.4 Species transport equation -- 3.3 Constitutive equations -- 3.3.1 A lattice

heat transfer -- 8.3.1 One-dimensional (1D) heat transfer analysis -- 8.3.2 Two-dimensional (2D) heat transfer analysis -- 8.3.3 Numerical analysis -- 8.3.3.1 Macroscopic model prediction -- 8.3.3.2 Pore-level heat transfer -- 8.4 Transient phenomena -- 8.4.1 General transient operation -- 8.4.2 Transient subfreezing operation -- 8.4.2.1 Temperature evolution and voltage loss -- 8.4.2.2 Activation voltage loss -- 8.4.2.3 Ohmic voltage loss -- 8.5 Experimental measurement of thermal conductivity -- 8.6 Cooling methods -- 8.6.1 Heat spreaders cooling -- 8.6.2 Cooling by air or liquid flow -- 8.6.3 Phase-change-based cooling -- 8.7 Example: a thermal system of automotive fuel cells -- 8.7.1 A lumped-system model of a PEM fuel cell -- 8.7.2 Bypass valve -- 8.7.3 Radiator -- 8.7.4 Transport delay -- 8.7.5 Fluid mixer -- 8.7.6 Cathode intercooler -- 8.7.7 Anode heat exchanger -- 8.8 Chapter summary --
9. Coupled thermal-water management: phase change -- 9.1 Introduction to phase change -- 9.2 Vapor-liquid phase change: evaporation and condensation -- 9.2.1 Vapor-phase water diffusion and heat pipe effect -- 9.2.2 GDL de-wetting -- 9.2.3 GDL de-wetting and voltage loss -- 9.2.4 A general definition of the Damkohler number, Da -- 9.2.4.1 Local heating and vapor-phase removal -- 9.2.4.2 A specific Damkohler number -- 9.2.4.3 Liquid-free passages -- 9.2.4.4 2D numerical simulation -- 9.3 Freezing/thawing -- 9.3.1 Temperature spatial and temporal variation -- 9.3.2 Non-isothermal cold start -- 9.3.3 Freezing/thawing and degradation -- 9.4 System-level analysis of coupled thermal and water management -- 9.4.1 Flow rates of species and two-phase flows -- 9.4.2 Energy balance -- 9.5 Chapter summary.

Sommario/riassunto

Polymer electrolyte membrane (PEM) fuel cells, which convert the chemical energy stored in hydrogen fuel directly and efficiently to electrical energy with water as the only by-product, have the potential to reduce our energy usage, pollutant emissions, and dependency on fossil fuels. Tremendous efforts have been made so far, particularly during the last couple of decades or so, on advancing the PEM fuel cell technology and fundamental research. In addition to the large number of research and review paper publications, several classic books have been published and are available in the market, which are primarily for introductory level readers. There are, however, very few books that address the graduate-level or advanced aspects of PEM fuel cells and are based on the first principles or conservation laws, dimensionless analysis, time constant evaluation, and numerical simulation by solving partial differential equations. There are abundant knowledge regarding flow, heat transfer, and mass transport in general engineering, which has been successfully extended to the water and thermal management of PEM fuel cells. This book contributes to this aspect of PEM fuel cell technology; that is, it focuses on the fundamental understanding of phenomena or processes involved in PEM fuel cells.

2.

Record Nr.	UNINA9910811051403321
Autore	Abbott Stacey
Titolo	Undead apocalypse : vampires and zombies in the 21st century / / Stacey Abbott [[electronic resource]]
Pubbl/distr/stampa	Edinburgh : , : Edinburgh University Press, , 2016
ISBN	1-4744-2672-7 0-7486-9493-5 0-7486-9492-7
Descrizione fisica	1 online resource (ix, 225 pages) : digital, PDF file(s)
Classificazione	HD 402
Disciplina	791.43/675
Soggetti	Vampire films - 21st century - History and criticism Vampires on television - 21st century - History and criticism Zombie films - 21st century - History and criticism Criticism, interpretation, etc.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 11 Aug 2017).
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Machine generated contents note: ; 1. The Legacy of Richard Matheson's I Am Legend -- ; 2. `Cancer with a Purpose': Putting the Vampire Under the Microscope -- ; 3. The Cinematic Rising: The Resurgence of the Zombie -- ; 4. A Very Slow Apocalypse: Zombie TV -- ; 5. The Hybrid Hero -- ; 6. `Be Me': I-Vampire/I-Zombie -- ; 7. How to Survive a Vampire Apocalypse: Or, What to Do When the Vampires are Us.
Sommario/riassunto	Explores the intersection of the vampire and zombie with 21st Century dystopian and post-apocalyptic cinema.<p>Twenty-first century film and television is overwhelmed with images of the undead. Vampires and zombies have often been seen as oppositional: one alluring, the other repellant; one seductive, the other infectious. With case studies of films like I Am Legend and 28 Days Later, as well as TV programmes like Angel and The Walking Dead, this book challenges these popular assumptions and reveals the increasing interconnection of undead genres. Exploring how the figure of the vampire has been infused with the language of science, disease and apocalypse, while the zombie text has increasingly been influenced by the trope of the 'reluctant' vampire,

Stacey Abbott shows how both archetypes are actually two sides of the same undead coin. When considered together they present a dystopian, sometimes apocalyptic, vision of twenty-first century existence. </p>Key features
Rather than seeing them as separate or oppositional, this book explores the intersection and dialogue between the vampire and zombie across film and television
Much contemporary scholarship on the vampire focuses on Dark Romance, while this book explores the more horror-based end of the genre
Offers a detailed discussion of the development of zombie television
Provides a detailed examination of Richard Matheson's I Am Legend, including the novel, the script, the adaptations and the BBFC's response to Matheson's script